

CLINICAL IMAGE

PEER REVIEWED | OPEN ACCESS

Right ventricular pseudoaneurysm after pericardiocentesis: A rare image

Fábia Cruz, Diana Brites, Sara Sintra, Maria Eugénia André

CASE REPORT

The authors report the case of a 75-year-old male patient with the following medical history: controlled hypertension, type 2 diabetes and hyperlipidemia, heavy cigarette smoking history, rectal cancer in remission for ten years, a small chronic pericardial effusion of unknown origin, coronary heart disease with the need for implantation of two drug-eluting stents two months ago and since then medicated with dual antiplatelet therapy (ticagrelor 90 mg twice a day and acetylsalicylic acid 100 mg once a day), and stage 5 chronic kidney disease resulting from atherosclerotic renal artery stenosis and recently initiated on hemodialysis.

A recent routine transthoracic echocardiogram (TE) revealed moderate pericardial effusion (14.9 mm) with mild right atrial collapse and the electrocardiogram (ECG) showed a sinus rhythm with a heart rate of 72 and normal QRS wave progression (Figure 1A). One week later, during hemodialysis session, the patient presented to the emergency department with nausea, vomiting, abdominal pain, pallor, cyanosis, weak central pulse, hypotension, jugular vein distention, and muffled hearth

sounds (Beck triad). Electrocardiogram (ECG) showed a low QRS voltage in precordial leads compared to previous ECG (Figure 1B). Chest computed tomography (CT) scan revealed a large pericardial effusion. Ultrasound-guided pericardiocentesis was promptly performed and 650 mL of hemorrhagic pericardial effusion was immediately drained with cardiogenic shock clinical improvement. A pericardial catheter was applied and the patient was admitted to intensive care unit.

Pericardial fluid cultures were negative to bacterial and fungal infection. Biochemical and cytologic pericardial fluid analysis was not made in order to proceed to chronic pericardial effusion investigation.

After three days of hemodynamic stability and decreasing pericardial effusion in drainage, confirmed by TE, pericardial catheter was removed and the patient discharged. Ticagrelor treatment was discontinued.

One month later the patient did a new TE that showed a mild to moderate pericardial effusion. Because of his previous disease he further did a cardiac CT that revealed a right ventricular (RV) pseudoaneurysm (Figures 2 and 3), likely related to the previous pericardiocentesis.

Fábia Cruz¹, Diana Brites¹, Sara Sintra², Maria Eugénia André³

Affiliations: ¹Resident, Department of Internal Medicine, Centro de Responsabilidade Integrada de Medicina Interna, Hospital Amato Lusitano, Unidade Local de Saúde de Castelo Branco, Castelo Branco, Portugal; ²Hospital Assistant, Department of Internal Medicine, Centro de Responsabilidade Integrada de Medicina Interna, Hospital Amato Lusitano, Unidade Local de Saúde de Castelo Branco, Castelo Branco, Portugal; ³Senior Graduate Assistant, Department of Internal Medicine, Centro de Responsabilidade Integrada de Medicina Interna, Hospital Amato Lusitano, Unidade Local de Saúde de Castelo Branco, Castelo Branco, Portugal.

Corresponding Author: Fábia Cruz, CRI-MI, Hospital Amato Lusitano, Av. Pedro Álvares Cabral, 6000-085 Castelo Branco, Portugal; Email: fabia_sofia@hotmail.com

Received: 27 October 2022
Accepted: 16 December 2022
Published: 05 January 2023

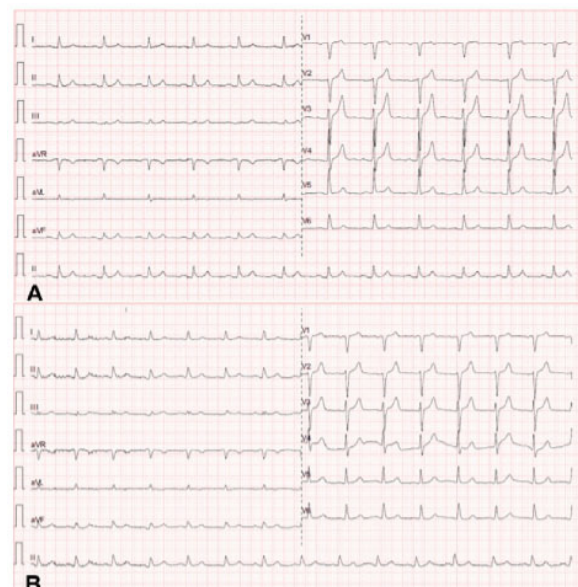


Figure 1: Suggestive worsening pericardial effusion in ECG during cardiogenic shock. (A) Normal ECG. (B) In cardiogenic shock: low voltage QRS in precordial leads.



Figure 2: Post-intravenous contrast cardiac CT. (A) Sagittal view and (B) Axial view: Right ventricular pseudoaneurysm (19×16 mm) with a narrow neck (4 mm) (white arrows), pericardial fat (blue arrowhead), and pericardial effusion (yellow stars).



Figure 3: 3D reconstruction cardiac CT: right ventricular pseudoaneurysm (white arrows).

DISCUSSION

Right ventricular pseudoaneurysm is a rare and potentially fatal condition [1, 2]. Ventricular pseudoaneurysm is a contained rupture of the ventricular wall that may occur due to cardiac surgery, infective endocarditis, myocardial ischemia, syphilis, after penetrating chest trauma, endomyocardial biopsy, central venous or pulmonary artery catheterization, and transcatheter valve replacement [1–4].

A cardiac pseudoaneurysm differs from a true aneurysm by its wall which does not contain myocardial tissue and connects to the ventricle by a narrow neck. Thus, ventricular pseudoaneurysm is prone to fatal rupture and subsequent high mortality [3].

The diagnosis of RV pseudoaneurysm is often a challenge because of its rarity and lack of typical clinical features [3]. Most patients present with chest pain and dyspnoea; however, up to 10% can be asymptomatic [2]. As a result, advanced imaging techniques have become the hallmark of RV pseudoaneurysm identification [5]. Optimal management remains unclear. However, the primary goal is to reduce the incidence of rupture [2].

Furthermore, heparin, a commonly used anticoagulant agent, is frequently used in patients undergoing hemodialysis [6]. The use of heparin is often perceived as a possible risk factor for the development of a worsening or hemorrhagic pericardial effusion that may result in cardiac tamponade [7].

This patient presented with cardiogenic shock possibly due to heparin-induced hemopericardium following hemodialysis. The use of dual antiplatelet therapy increased the risk of bleeding complications.

Cardiac tamponade was diagnosed by the authors in the setting of relevant clinical presentation in combination with ECG and chest CT findings.

Emergent pericardiocentesis was performed with clinical improvement. After this technique he developed an iatrogenic pseudoaneurysm, as it was confirmed by cardiac CT, which is corroborated by the literature.

CONCLUSION

We add to the literature a case of right ventricular pseudoaneurysm after pericardiocentesis, an extremely rare complication.

Keywords: Pericardial cardiac tamponade, Pericardial effusion, Pericardiocentesis, Pseudoaneurysm false aneurysm

How to cite this article

Cruz F, Brites D, Sintra S, André ME. Right ventricular pseudoaneurysm after pericardiocentesis: A rare image. *Int J Case Rep Images* 2023;14(1):1–3.

Article ID: 101371Z01FC2023

doi: 10.5348/101371Z01FC2023CI

REFERENCES

1. Kumar R, Halder V, Prasad K, Sharma A, Dahiya N. Idiopathic right ventricular pseudoaneurysm presenting with ventricular tachycardia: A case report. *Gen Thorac Cardiovasc Surg* 2021;69(7):1151–4.
2. Lippmann M, Wiley M, Freeman J, Abicht T, Nath J. Percutaneous closure of a traumatic right ventricular pseudoaneurysm: A novel interventional approach. *CASE (Phila)* 2019;3(2):60–2.
3. Esmat HA, Ceylan N, Demir E, Çinkooglu A. Right ventricular pseudoaneurysm in a young adult following right heart catheterization: A rare case report and review of the literature. *Egypt J Radiol Nucl Med* 2021;52(30):1–4.

4. Alkhouli M, Waits B, Chaturvedi A, Ling FS. Percutaneous closure of right ventricular pseudoaneurysm. *JACC Cardiovasc Interv* 2015;8(9):e147–8.
5. Gaddipati VC, Martin AI, Valenzuela MO, Mahmud A, Patel AA. An incidentally detected right ventricular pseudoaneurysm. *Case Rep Cardiol* 2017;2017:4352474.
6. Su HM, Voon WC, Chu CS, Lin TH, Lai WT, Sheu SH. Heparin-induced cardiac tamponade and life-threatening hyperkalemia in a patient with chronic hemodialysis. *Kaohsiung J Med Sci* 2005;21(3):128–33.
7. Adler Y, Charron P, Imazio M, et al. 2015 ESC Guidelines for the diagnosis and management of pericardial diseases: The Task Force for the Diagnosis and Management of Pericardial Diseases of the European Society of Cardiology (ESC) Endorsed by: The European Association for Cardio-Thoracic Surgery (EACTS). *Eur Heart J* 2015;36(42):2921–64.

Author Contributions

Fábia Cruz – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Diana Brites – Conception of the work, Design of the work, Acquisition of data, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Sara Sintra – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of

data, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Maria Eugénia André – Design of the work, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Guarantor of Submission

The corresponding author is the guarantor of submission.

Source of Support

None.

Consent Statement

Written informed consent was obtained from the patient for publication of this article.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

Copyright

© 2023 Fábia Cruz et al. This article is distributed under the terms of Creative Commons Attribution License which permits unrestricted use, distribution and reproduction in any medium provided the original author(s) and original publisher are properly credited. Please see the copyright policy on the journal website for more information.

Access full text article on
other devices



Access PDF of article on
other devices



